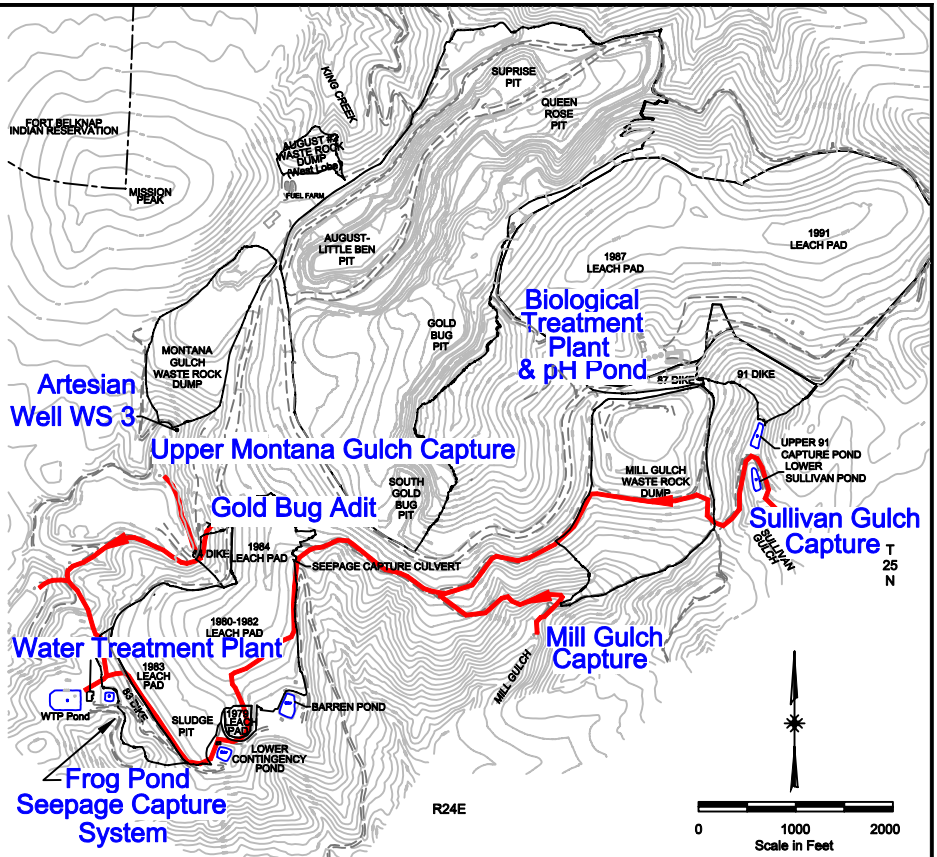


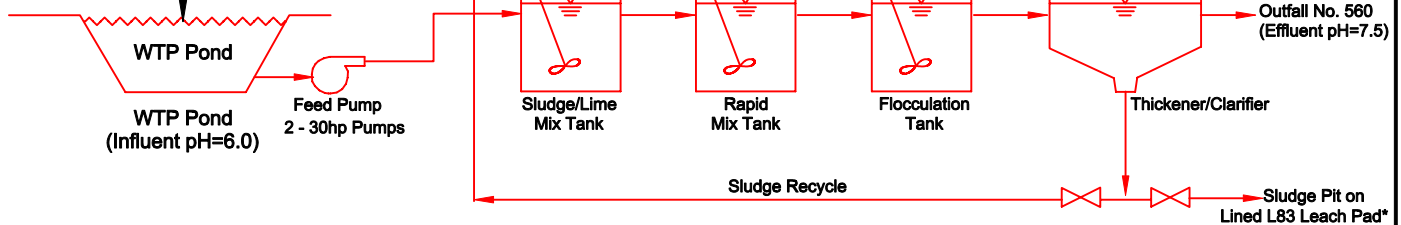
Capture Systems

- ← **Sullivan Gulch (9/19/1997)**
Upper 91 Pond - 1,871mm gallon capacity
Lower Sullivan - 1,768mm gallon capacity
Capture Trench - 94,119 gallon capacity
Capture System - 3-10hp pumps @ 85 gpm each
Avg. Pumpback - 11.0 gpm (Life to Date)
Avg. Pumpback - 13.9 gpm (2005)
Construction Cost - \$297,831
- ← **Mill Gulch (9/19/1997)**
Capture Trench - 123,102 gallon capacity
Capture System - 2-10hp pumps @ 80gpm each
1-25hp pump @ 250gpm each
Avg. Pumpback - 37.2 gpm (Life to Date)
Avg. Pumpback - 41.1 gpm (2005)
Construction Cost - \$357,201
- ← **Upper Montana Gulch (10/23/1997)**
Capture Trench - 97,243 gallon capacity
Capture System - 2-7.5hp pumps @ 135gpm each
1-15hp pump @ 300gpm
Avg. Upper Pumpback - 10 gpm
Avg. WS-2 Well - 25-30 gpm
Avg. WS-3 Pumpback - 165 gpm
Construction Cost - \$217,151
- ← **Gold Bug Adit**
Capture System - Gravity Feed to LWTP
Avg. Pumpback - 146 gpm (Life to Date)
Avg. Pumpback - 108 gpm (2005)
Construction Cost - \$21,527
- ← **Frog Pond Capture System**
Capture System - 1 hp pump
Avg. Pumpback - 1.4 gpm
(20 gpm for 12 hr/week)



364 gpm for 2005 into
Landusky Water Treatment Plant
Construction Cost - \$3,420,915

- Sullivan Gulch 14 gpm @ 3.5-4.1 pH
- Mill Gulch 41 gpm @ 3.8-4.4 pH
- Upper Montana Gulch 10 gpm @ 4.3-4.8 pH
- Artesian Well WS-2 25-30 gpm @ 6.3 pH
- Artesian Well WS-3 165 gpm @ 6.9 pH
- Gold Bug Adit 108 gpm @ 6.0 pH
- Frog Pond 1.4 gpm



Biological Plant Treatment System (8/29/2002)
Treatment System - Three 250,000 gallon tanks
System - Gravity Feed to MT Gulch Pond
Typical Flow - 75-300 gpm (150 gpm average)

Montana Gulch Pond (1,346 mm gallon capacity)
Outfall No. 560
(Effluent pH=7.5)

	WTP Pond		Sludge/Lime Mix Tank	Rapid Mix Tank	Flocculation Tank	Thickener/Clarifier
VOLUME (Gallons)	12,500,000	700 gpm Max. Input	600	10,200	45,000	180,000
SIZE	250' x 360' x 30' deep				20 ft High, 20 ft Diameter	15 ft High, 45 ft Diameter
DETENTION TIME (minutes) at Design Flow of 600 gpm	20,833 (14.5 days)		1	17	75	300
DETENTION TIME (minutes) at Average Flow of 350 gpm	35,714 (24.8 days)		2	29	129	514

* Sludge Flow Rate:
50 gpm, 8 hr/day, 120 days/year
Total Sludge Flow of 2,880,000 gal/year.

SPECTRUM
ENGINEERING

1413 4th Ave. North
Billings, MT 59101
Phone: (406) 259-2412

February 2006

LANDUSKY MINE
RECLAMATION PROJECT
Phillips County, Montana

LANDUSKY WATER TREATMENT
PROCESS FLOW SCHEMATIC

FILE NAME: 8x11Land_cap2006.dwg

SHEET NO. 1 OF 1